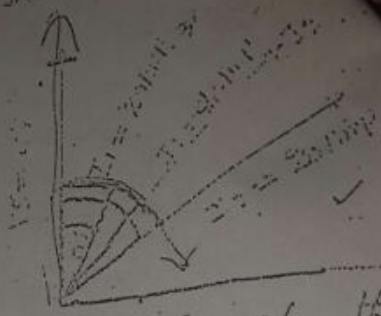


$I_1 =$   
 $I_2$

9.12)

For  $E_g = 100 \angle 45^\circ$

Only the Source Voltage will Shifted by an angle of  $90^\circ$  and  $\rightarrow$  The phase angle of the current phasors w.r.t the Voltage will remain the same;



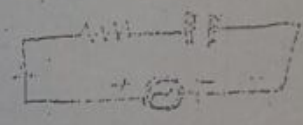
9.13)

Data:-

- $P = 800W$
- $I = 25 \text{ Amp}$
- $V = 220V$
- $f = 60 \text{ cycle/s}$

- a) Series  $R = ?$   $C = ?$
- b) parallel  $R = ?$   $C = ?$

Soln:- For Series;



$$P = I^2 R$$

$$\Rightarrow R = P/I^2 = 800/25$$

$$R = 1.28$$

$$V = IZ$$

$$\Rightarrow Z = 220/25$$

$$\Rightarrow Z = 8.8\text{-ohms}$$

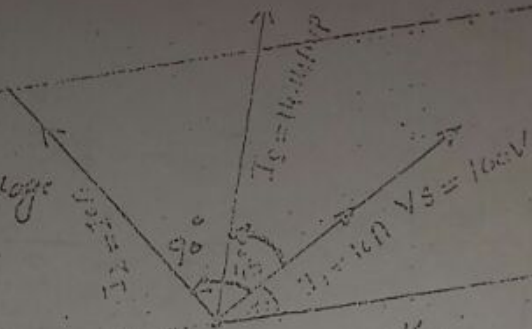
$$Z = \sqrt{R^2 + X_c^2}$$

$$X_c = \sqrt{(8.8)^2 - (1.28)^2}$$

$$= \sqrt{75}$$

$$X_c = 8.7$$

phases  
w.r.t the Source Voltage  
will be the same



The phasor angles relative to the  
+ve or reference axis are;

$$\theta_1 = 30^\circ \text{ for } I_1$$

$$\theta_2 = 120^\circ \text{ for } I_2$$

$$\theta_3 = 75^\circ \text{ for } I_3$$

Data:-  $Z_L = R + jX_L$   
 $Z_L = 3 + 4j \rightarrow \textcircled{1}$

$Z_C = R - jX_C$   
 $Z_C = 0 - j10 \rightarrow \textcircled{2}$

$V = 100V$   
 $f = 1000 \text{ Hz}$   
 $E_g = 100 \angle 0^\circ$

Required:-

a)  $I_1 = ?$   $I_2 = ?$   $I = ?$

b) - phasor diagrams.

Soln:- converting to  
polar form;

$$Z_1 = 3 + 4j$$

$$Z_1 = 5 \angle 53.1^\circ$$

$$Z_2 = 10 \angle -90^\circ$$

Now,  $I_1 = \frac{V_S}{Z_1} = \frac{100}{5 \angle 53.1^\circ} = 20 \angle -53.1^\circ$

